

2.3 mm. in diameter; rays fairly wide (0.4 mm.) and evenly curved or U-shaped; inter-ray areas level. Entire surface slightly reticulate; no evidence of any pillars. Surface diameter of the lateral chambers 78 microns.

In equatorial section; the nucleocoenoch composed of the initial chamber 109.2 microns in diameter, surrounded for about two thirds of its circumference by the second chamber; diameter of whole nucleocoenoch 218.4 microns, with walls 11 microns thick. Equatorial chambers normally rectangular, but elongated radially at seven places, giving rise to seven ray like series of chambers. Normal equatorial chambers at the center 31.2 microns in radial diameter, 19.5 microns in tangential diameter, with walls 9 microns thick; at the periphery, 46.8 microns in radial diameter, 19.5 microns in tangential diameter, with walls very thin, only 3 microns thick. Equatorial chambers of the "rays" at the center 46.8 microns in radial diameter, 19.5 microns in tangential diameter, with walls 7.8 microns thick; at the periphery, nearly the same size, 46.8 microns in radial diameter, 21 microns in tangential diameter, with walls 5.6 microns thick.

In vertical section the wall between the equatorial chambers and the lateral chambers 7.8 microns thick. Vertical diameter of the equatorial chambers 19 microns at the center of the test, increasing evenly to 43 microns in diameter at the periphery. Lateral chambers arranged in columns; vertical diameter 19 microns near the surface at the center of the test, the horizontal walls about 5 microns thick. There are a total of 18 lateral chambers on the sides of the equatorial layer near the center of the test.

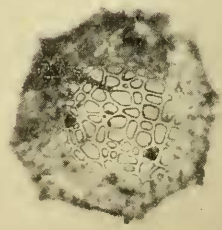
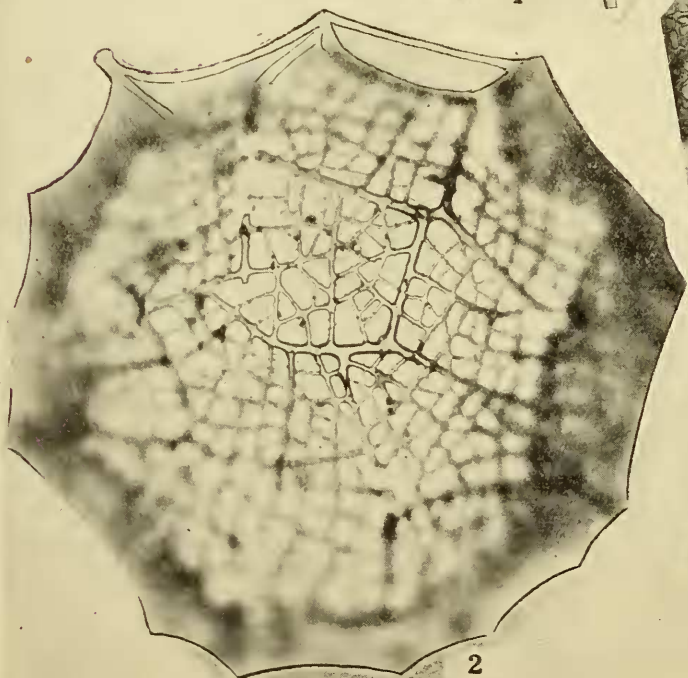
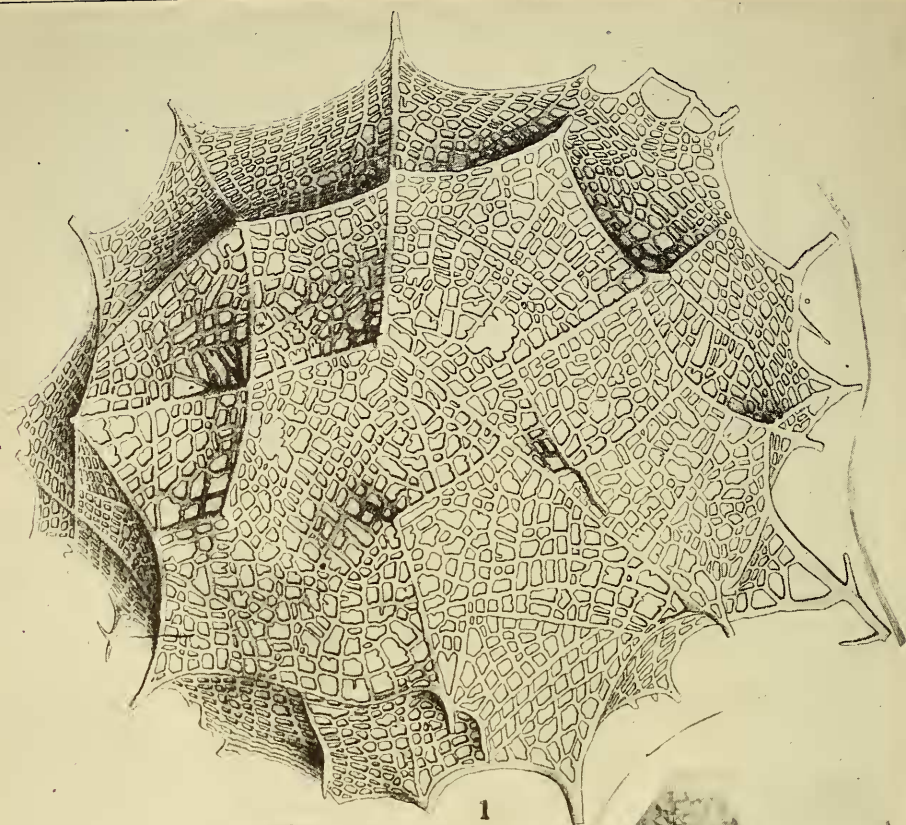
Occurrence: In a grayish-brown, calcareous, gritty sandstone exposed near Calita Sal, Department of Piura, Peru. Associated with "*Orthophragmina*" (*Asterodiscocylin*a) *stewarti* W. Berry, "*Orthophragmina*" (*Discocylin*a) *peruviana* Cushman and "*Orthophragmina*" (*Discocylin*a) *salensis* W. Berry.

This species cannot be compared with any that I know of. Most of the described forms have the same number of interior and exterior "rays." In this species, however, there are constantly six surface "rays" and seven interior "rays." I have no sections of the six-rayed forms that do not show seven interior "rays."

PALEONTOLOGY.—*Two new larger Radiolaria from Peru.*¹ WIL-LARD BERRY, Johns Hopkins University. (Communicated by JOHN B. REESIDE, JR.)

The literature on fossil Radiolaria is relatively meager and predominantly relates to the smaller flask-shaped or conical forms of Nassellaria (Monopylaria) and Phaeodaria (Tripylaria). The discovery of two large related species belonging to the group which Haeckel christened Order Phaeosphaera is therefore of especial interest, not only because of their size but also because of their presence in large numbers in a shallow water deposit. The illustrations fall far short of doing justice to the exquisite beauty of the fossils, a beauty

¹ Received March 1, 1929.



which may be visualized by comparison with the accompanying copy of Haeckel's drawing of *Oroscena huxleyi*, a very similar existing species.

Members of the Phaeosphaera were first discovered by the Challenger Expedition and in his account of the Radiolaria Haeckel referred to the order 27 species in 4 genera. They are remarkable for their size, averaging from 1 to 3 millimeters in diameter. The tests are relatively coarse, mostly subspherical, and without special apertures. Haeckel speaks of them as rare and confined to great depths (1095 to 3125 fathoms), failing to recognize that the large size and spherical form stamp them as pelagic, surficial types—an indication which seems confirmed by the finding of the present species in abundance in shallow-water sediments. Presumably the material studied by Haeckel came from bottom samples of radiolarian ooze, but it seems remarkable that they have not been taken in tow nets, if indeed they have not, since they occur in all of the warmer oceans.

The present specimens came from a depth of 365 feet in a boring southeast of Bayovar, department of Piura, Peru, where they were associated with fragments of echinoid spines; tiny broken fishbones, vertebrae, and teeth; and numerous smaller foraminifera, including *Cristellaria*, *Textularia*, *Miliolina*, *Uvigerina*, *Nonionella*, and *Bulimina*.

The age is probably Pleistocene.

The new species may be described as follows:

***Oroscena bayovarana* W. Berry, n. sp.**

Fig. 2

Subspherically polyhedral, averaging 1.5 millimeters in diameter exclusive of the radial spines. Lattice coarse both as to the aerolation and the size of the siliceous mesh. The coarser rods, 2 or 3 times the diameter of the finer rods, form rafter-like, somewhat concave ridges bounding the larger polygonal areas, which are pronouncedly concave. The lattice within the concave areas formed by the larger rods is made up of delicate rods subtending 3 to 5 sided areolae; and many of these rods bear one to several fine spines in the plane of the lattice, frequently extending half way across an areola. Where the larger rafter-like rods join, usually in threes but sometimes in fours, they curve outward like an A tent and form the base for a stout radial spine. In the fossil material these spines are all broken off a short distance above their bases, and it is impossible to determine whether they were simple or branched.

Fig. 1.—*Oroscena huxleyi* Haeckel, $\times 50$, tropical Atlantic

Fig. 2.—*Oroscena bayovarana* W. Berry, n. sp., $\times 56$, Peru

Fig. 3, 4.—*Oroscena peruviana* W. Berry, n. sp., $\times 30$, Peru

This species is less abundant than *Oroscena peruviana*. In its general form it is closest to the existing *Oroscena huxleyi*, described from 2740 fathoms in the Atlantic west of the Canary Islands, but differs in its somewhat smaller size, larger meshes, and greater development of secondary spines.

***Oroscena peruviana* W. Berry, n. sp.**

Figs. 3, 4

Nearly spherical, the average diameter near 1 millimeter. The rods of the lattice show less differentiation, being more nearly uniform in diameter, lacking concave areas bounded by larger rods. The angles of the mesh, and hence the areolae, are rounded. The radial spines are more numerous than in *Oroscena bayovarana* and relatively stouter, but all are broken off so that their distal character is unknown; they are smooth as far as preserved and the framework at their base does not recurve tentlike as in the associated larger species. An additional distinctive feature of *P. peruviana* is the smoothness of the rods of the lattice, no traces of lateral spines having been observed. This species is exceedingly common.

PALEONTOLOGY.—*Coleoptera from the lower Eocene (Wilcox) clays.*¹ H. F. WICKHAM, Iowa City, Iowa. (Communicated by EDWARD W. BERRY.)

Some time ago I received from Professor Edward W. Berry of the Johns Hopkins University, a small lot of coleopterous elytra from the Wilcox clays of lower Eocene time. As no Coleoptera are described from this horizon it has seemed worth while to characterize and name the material, even though it is insufficient to give any definite clues as to the climatic or other local conditions.²

Genus ELATER Linnaeus

***Elater berryi* Wickham, n. sp.**

Fig. 3

Represented by an elytron, 8.50 millimeters long and 2.75 millimeters wide, the extreme tip lacking. It is of narrow form, the sides sub-parallel for the major part of the length, the tapered portion so much injured that its proportionate size can not be measured. The surface is moderately finely

¹ Received March 1, 1929.

² It has always been a subject for comment that the remains of insects were so scarce in the fine grained clays of the Wilcox group which contain such a wealth of delicate plant material. In 1925 Dr. Collins described the wing of a termite (R. E. L. COLLINS. Am. Journ. Sci. 9: 406-410. fig. 2, 1925) and in 1927 I described the cases of a caddis worm (EDWARD W. BERRY. Proc. U. S. Natl. Museum, 71, Art. 14. 1927) from these beds. Professor Wickham has now described the few beetle elytra resulting from very intensive collecting during which over 500 species of plants have been obtained. We have a single wing of some hymenopterous form and other caddis cases which have not yet been described. E. W. B.